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Tough SmartMarquee™

Getting Started

Tough SmartMarquee™

UTICOR

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WARNING!

Programmable visualization products such as the ToughSmartMarquee are not fail-safe devices and as such must not be used for stand-alone protection in any application. Any reliance on these devices for equipment or personnel safety is unwarranted.

The diagrams and examples in this user manual are included for illustrative purposes only. The manufacturer cannot assume responsibility or liability for actual use based on the diagrams and examples.

WARNING: If the Marquee is used in a CLASS I, DIV. 2 environment, the following conditions must be met: Class I, Div. 2 methods; AND — must conform to all rules and requirements of applicable jurisdictions regarding Class I, Div. 2 installations; ALSO — peripheral equipment controlling this device or being controlled by it shall be suitable for service in the location in which they are used. Failure to comply with any of the above installation requirements will invalidate the device's qualifications for service in CLASS I, DIV. 2 hazardous locations.

WARNING: EXPLOSION HAZARD — substitution of components may impair suitability for CLASS I, DIVISION 2.

WARNING: EXPLOSION HAZARD — do not disconnect equipment unless power has been switched off or the area is known to be non-hazardous.

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ToughSmartMarquee Getting Started Guide
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MANUAL ORGANIZATION

The information below provides an overall description of the topics covered within this guide.

Chapter 1: Getting Started

Defines ToughSmartMarquee and provides information on what you need to get started and display messages. Gives you a quick reference to get familiar with your ToughSmartMarquee. Discusses how to get help with questions you might encounter and how to contact Technical Support.

Chapter 2: Wiring and Connection Information

Provides information about preparing the marquee for operations such as connecting Power and how to interface Marquee for Serial and Ethernet communication.

Chapter 3: Programming the Marquee

Describes how to configure various PLC tag-dependent Messages (in the Programming software) to be sent to the ToughSmartMarquee. These messages are stored in the Marquee itself.

Document Version History

Date	Notes
April , 2010	ToughSmartMarquee Getting Started – First Released Version
February, 2010	ToughSmartMarquee Getting Started – Draft version

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1. GETTING STARTED

1.1 INTRODUCTION- TOUGH SMART MARQUEE

The **ToughSmartMarquee** is a unique intelligent LED display product used with industrial control systems. The ToughSmartMarquee stores user programmed messages along with the conditions under which each message would be displayed. The marquee would then continuously poll control system’s controller, such as PLC, evaluate programmed conditions and display corresponding messages on one or more connected slave marquees.

This Getting Started guide will take you through the steps necessary to get your Tough Smart Marquee up and running in the shortest possible time.

1.2 SYSTEM REQUIREMENTS AND RESOURCES

Hardware

- ToughSmartMarquee display
- 110/220 VAC input power cord with stripped wires on one end
- RS-232C Programming Cable with standard 9-pin connector on one (PC) end and the other end un-terminated (3 stripped wires to connect to the ToughSmartMarquee terminal strip)
- Ethernet cables as required
- PC requirements:
 - a. IBM or compatible PC (Pentium or better) with a mouse and separate serial port (USB port may be used with a Serial to USB converter)
 - b. Display with at least 800 x 600 resolution (1024 x 768 recommended)
 - c. Standard Windows XP/Vista® operating system

Software:

ToughSmartMarquee Software (version 0.99.14 and higher)

	Please Note: ToughSmartMarquee software does not support any Windows OS earlier than Windows XP, i.e. the editor will not work on Windows 95, 98 or 2000.
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The software also contains an extensive Help section, which provides detailed information on ToughSmartMarquee programming.

Please refer to the following resources; to answer your hardware and software related questions:

Queries	Information Resources
Marquee Mounting and Installation	ToughSmartMarquee Hardware User manual
Marquee wiring and connections	ToughSmartMarquee Getting Started guide (this manual)
Marquee Programming	ToughSmartMarquee Programming software- Help Section

2. TOUGHSMART MARQUEE – INSTALLATION AND WIRING

This chapter provides information and procedures on connecting power and preparing the Marquee for serial or Ethernet communication.

2.1 A TYPICAL MARQUEE SYSTEM OVERVIEW

A typical Marquee control system comprises of a PLC (Programmable Logic Controller) to drive the logic and a Master/Slave Marquee to display the messages based on the PLC logic. The Master Marquee itself can drive a network of several Slaves.

Note: A PC is only required to initially program the Marquee and the PLC.

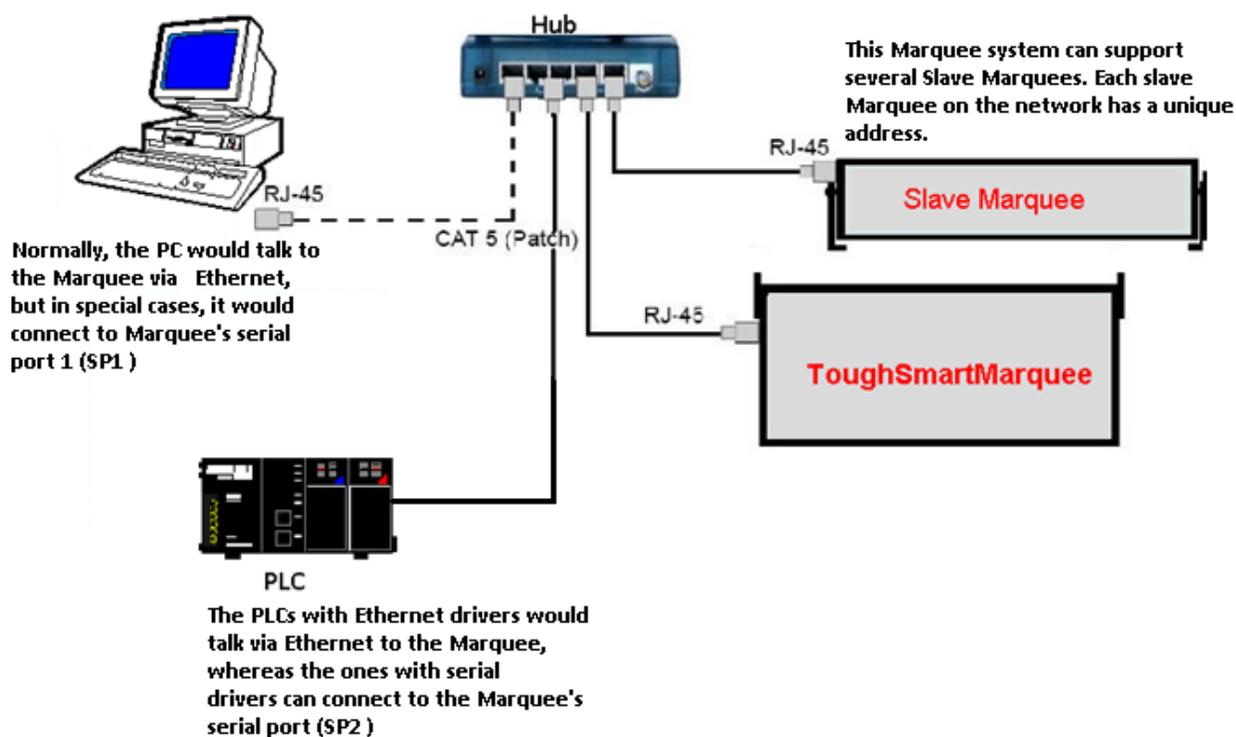


Fig 1.3.1 A Typical Marquee System

2.2 MOUNTING THE TPRLS:

Please refer to **Chapter 3** in the ToughSmartMarquee Hardware manual for mounting and installation information.

2.3 ACCESING CONNECTORS AND SWITCHES

The ToughSmartMarquee has an Access/Cover plate on its backside. This is a gasketed cover plate with two sealed grommets for power and communication cables. The gasket and the grommet seal must be intact to retain NEMA 12 rating. Once you remove the cover plate by removing the four access screws on the plate, you have access to wiring terminals required for marquee communication. See picture below:

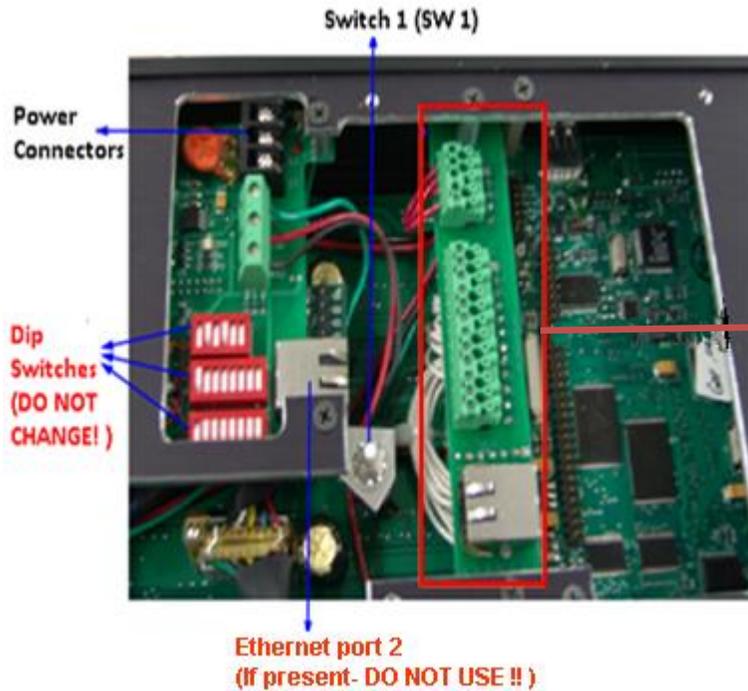


Fig 2.1.1 Marquee Board

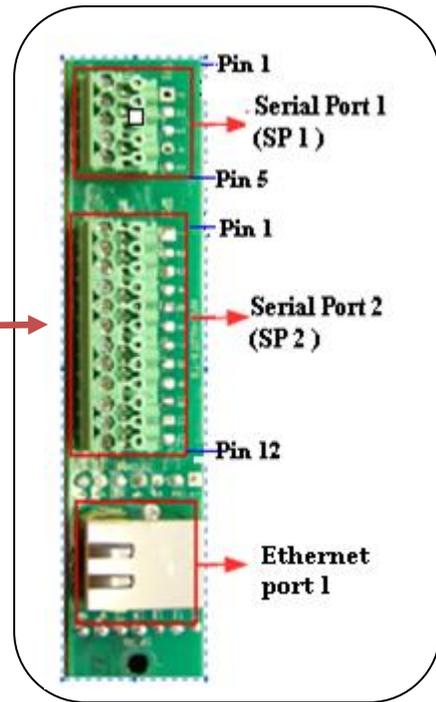


Fig 2.1.2 Connectors for User's Wiring Purpose

Dip Switches:



CAUTION!
Please **DO NOT TOUCH** any of the DIP switches. They are for factory use only! Changing DIP switches may make the product inoperable.

Ethernet Port:



CAUTION!
If there is a second Ethernet Port available on the Marquee board, please use only the Ethernet Port1 shown in fig 2.1.2, for Marquee programming and communication purposes. **DO NOT use Ethernet Port2 (marked in Fig 2.1.1)**

2.4 CONNECTING POWER

The Marquee’s power input is 110-220VAC @ 50-60Hz. Three terminals are provided for connecting operating power to the unit. These terminals are located on the Control Board (see the figure 2.2 below). Power Input terminals are labeled L1, L2, and chassis ground (8). Always connect the ground terminal to the safety ground.

Connect the unterminated end of the AC Power Cord to L1, L2, and GND (Black or Brown to L1, White or Blue to L2, Green or Green w. Yellow stripe to GND).

Terminal Block	Pin	Lead	Wire (US)	Wire (European)
	8	(GND)	Green	Green/Yellow stripe
	L1	Load	Black	Brown
	L2	Neutral	White	Blue

Fig 2.2 Power connector pin-out

2.5 MARQUEE COMMUNICATION

2.5.1 SERIAL PORT1 (SP1) WIRING

Serial Port 1 (SP1) is pre-wired in the factory as shown below, i.e. Pins 1-2 on SP1 are jumpered together. This jumper connects the serial port on the Message Controller board within the marquee, to the serial port of the Message Display board in the marquee. The jumper is required for the Marquee to display messages sent from the controller.

This port IS NOT used for PLC communication. **Except in some special cases, the user would NOT wire anything to this port.**

Pin Number	Function
1	RX (Message Display Board)
2	TXD (Message Controller Board)
3	RXD (Message Controller Board)
4	TXD (Do Not Use)
5	GND

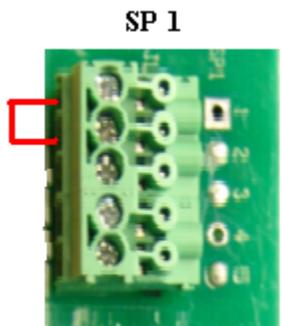


Fig 2.3.1 SP 1 pin-out

2.5.2 SERIAL PORT 2 (SP2) WIRING

The **SP2 connector** is used to connect the Marquee to the PLCs via **RS-232 or RS 422/485** (only one at a time) communication. If the user is using PLC over Ethernet, no wiring is required on this port. See Fig 2.3.2 below for Marquee to PLC connections.

SP 2



Pin Number	Pin Function (from the Marquee's perspective)	Marquee serial Communication
1	N.C.	
2	TXD	RS- 232
3	RXD	RS- 232
4	N.C.	
5	GND	RS- 232 / 422 / 485
6	N.C.	
7	N.C.	
8	N.C.	
9	RD+ (Receive Data)	RS- 422 / 485
10	RD- (Receive Data)	RS- 422 / 485
11	SD+ (Send Data)	RS- 422 / 485
12	SD- (Send Data)	RS- 422 / 485

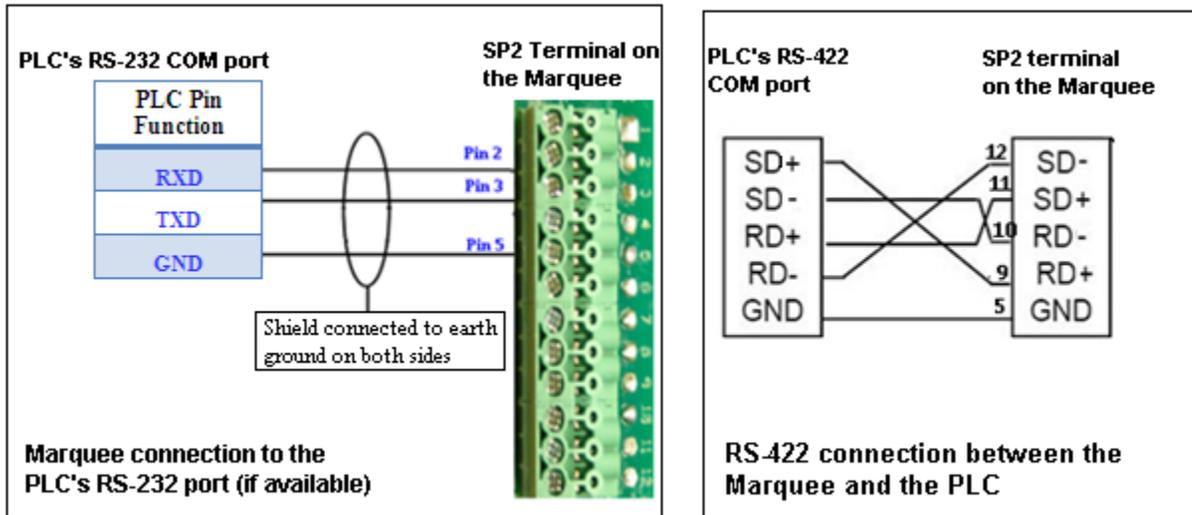


Fig 2.3.2 SP2 Pin-out and PLC wiring

2.5.3 ETHERNET PORT

The Ethernet port is connected to a switch or a hub in LAN. (If your Marquee unit has two Ethernet ports, please use the one below SP2 port; **DO NOT USE** the other Ethernet port).

The Marquee is generally programmed using the Ethernet port. (But, under certain cases as mentioned later, serial port SP1 may be used). In addition, the Marquee may communicate with PLCs over Ethernet when using Ethernet protocols such as Ethernet/IP, Modbus TCP/IP, etc.

The Factory-default IP settings are:

IP Address: 192.168.0.1 and Subnet Mask 255.255.255.0

The IP address of the Marquee is displayed on Power up. The user can change the IP address using the Marquee programming software (see section 3.4)

If you have trouble communicating over Ethernet ...

If, for some reason, you are unable to communicate over Ethernet, you can try communicating to the marquee over the Serial port (SP1) instead. The latter allows you to change IP address, download a new user program, or upgrade Marquee application (firmware) over the serial port.

To communicate with the Marquee using the Programming software running on a PC, follow these steps:

1. Turn off the power being supplied to the unit, and wire the serial port of PC to the serial port **SP1** on the Marquee's Controller board. The wiring diagram is as shown below (**DO NOT remove the jumper between pins 1-2 on the SP1 connector (refer to Fig. 2.3.1 for SP1 pin-outs)** :

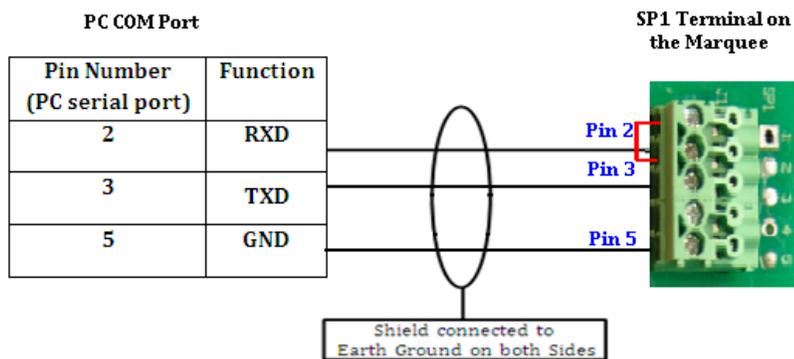


Fig 2.3.3 RS-232 connection (PC to Marquee)

2. Turn ON the power to Marquee. Wait till the marquee appears to be running (in about 30 sec).
3. Press on Switch 1 (SW1) located on the Marquee Controller Board to enter “**Setup Mode**”. The Marquee would beep twice to acknowledge that it’s in the Setup Mode. The following message is displayed on the Marquee:

IN SETUP MODE

4. Once in this Mode, you should be able to communicate to the Marquee from the PC through the programming software. You can check /modify IP parameters, download a new user program, or upgrade the Marquee firmware serially.
5. Push Switch SW1 again to exit the Setup Mode. The Marquee would now send a single long beep to acknowledge that it is exiting the Setup mode. (Please **DO NOT turn off the power** for at least 2 minutes to allow the marquee to save any changes made to its nonvolatile memory). The Marquee should start its normal operation and get into run mode. Remove the PC to Marquee serial connection.

Note: If there are no messages stored in the Marquee, then it would continue to show the “In Setup Mode” message even after exiting the Setup Mode.

2.6 MARQUEE MESSAGES SEEN ON POWER-UP

When the Marquee is initially powered up, it automatically displays a series of Messages; mainly the Marquee attributes (Baud rate, Group #, Unit # etc) as shown below:

REVISION	0	(Firmware Revision)
GROUP	01	(Group Number)
UNIT	0001	(Unit Number)
BAUD	38400	(COM port Baud rate)
CHAR	2"	(Character size)

Once the controller board is activated, a scrolling message appears displaying the ToughSmartMarquee’s IP address. Example:

CONTROLLER STATIC IP 192.168.0.1

After the IP address appears, the programmed messages (Power Up messages followed by PLC Messages) are displayed based on the PLC tag status and control parameters. **Section 3** explains how to program these messages.

POWER UP MESSAGE 1

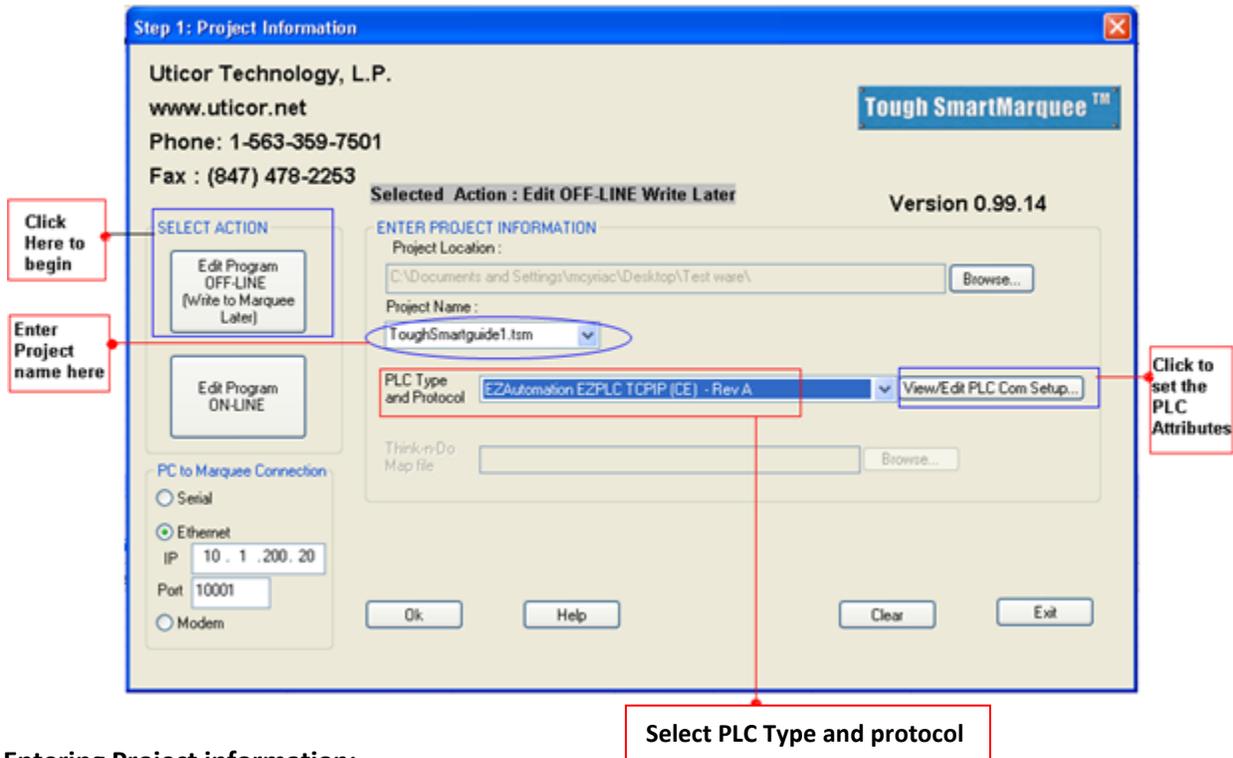
PLC MESSAGE

3. PROGRAMMING THE MARQUEE

The following example demonstrates how to enter the project information for a ToughSmart Marquee communicating to an EZ PLC via EZ Ethernet TCP/IP protocol.

3.1 ENTER PROJECT INFORMATION

Open ToughSmartMarquee programming software . The following dialog box appears:



Entering Project information:

1. On the Project Information screen, click on the **Edit Program OFF-LINE (Write to Panel Later)** button.
2. Under **Project Name**, enter the same. The primary ToughSmartMarquee file has a “.tsm” suffix.
3. Click on the DOWN arrow to the right of **PLC Type and Protocol** to view the list. In this example, select EZ PLC (Ethernet TCP/IP) – Connecting to an EZ PLC via Ethernet TCP/IP protocol.
4. Click on the **View/Edit PLC Com Setup** to edit the PLC attributes. The PLC Attributes dialog box applicable to the type of PLC selected in Step 3 above, will appear. Here you can make changes to the PLC communication setup. If communicating over Ethernet, “**Add PLC Details**” along with its Ethernet IP, gateway, Subnet masks etc. Click on OK to save the changes or ‘Help’ to view the help topics available for that particular PLC.
5. Now that you have entered the project information, click **OK** to save the project. You may click on **Clear** to clear the Project details and start over. **Exit** can be used to quit without saving the Project.

3.2 ADDING PLC MESSAGES TO THE MARQUEE

The ToughSmartMarquee software allows you to program different Marquee Messages, based on the tag values in the PLC. You can program Active or Inactive Messages based on whether the PLC tag condition is fulfilled or not. Refer to the “Add Messages” index in the ToughSmartMarquee software Help section for a detailed explanation on setting up Marquee Messages.

3.3 SETTING THE MARQUEE ETHERNET PARAMETERS AND UNIT NUMBER

1. CONFIGURE ETHERNET PARAMETERS:

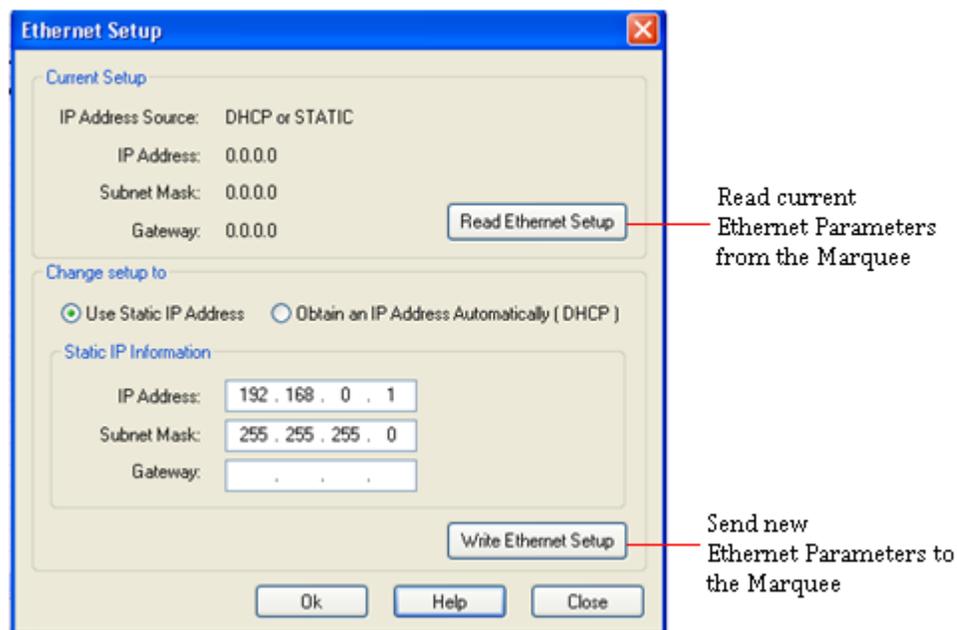
The Marquee’s Ethernet parameters can generally be programmed through the PC using the Marquee’s Ethernet port. But, under certain cases, serial port SP1 may also be used to configure the same:

a. Via Ethernet connection between the Marquee and the PC

In the Marquee software’s Main programming window, Click on menu **Marquee >Ethernet Setup**

Read the current Ethernet settings from the Marquee.

You can also configure the following Ethernet Parameters: IP Address, Subnet Mask, and Gateway Address and write them to the Marquee.



Resetting the IP address to its default value..

If for some reason, you want to reset the IP address of the Marquee to its default settings, press and hold the Switch 1 (SW1- located on the Marquee Controller Board), for 5 seconds till you hear 3 quick beeps...There is an approx. 5 second pause, after

which you should hear 3 beeps again. This would imply that the marquee has been set to its default IP address (192.168.0.1)

To assign new Ethernet parameters, enter Setup Mode again and assign the new IP address serially. You would be prompted to exit the Mode once the parameters have been set.

b. Via Serial connection between the Marquee and the PC:

If, for some reason, you are unable to communicate over Ethernet, you can try communicating to the marquee over the Serial port (SP1) instead and then change the Ethernet IP parameters using the Programming Software.

To do so, connect serially to the Marquee and enter the SETUP Mode (refer to **Section 2.5.3**). Using the Marquee software, change the PC to Marquee connection to “Serial”. Next, bring up the Ethernet Setup Dialog box and assign new IP settings to the Marquee. Once that occurs, you would be prompted to exit the Setup Mode.

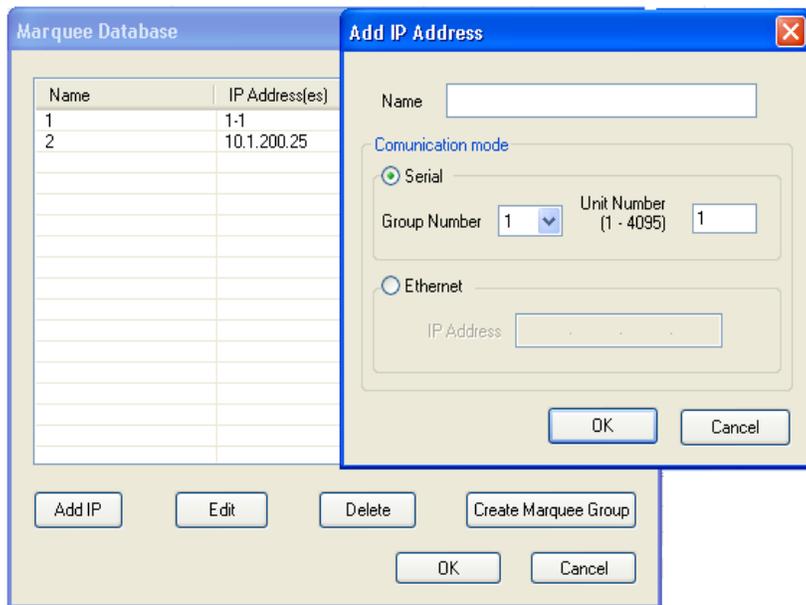
2. GROUP AND UNIT NUMBER

Each ToughSmartMarquee is assigned a unit address. A unit address is programmed into each message to specify which unit or units should display that message

Each unit address consists of two identifiers—a **Group** and a **Unit Number**. A group may contain up to 4095 slave units, connected serially or via Ethernet to the Master marquee. The unit addresses allow the ToughSmart message controller to select and send messages to select slave Marquee units.

The slave Marquees can be assigned the Group numbers and the Unit number using the Marquee software.

Click on menu **Setup ->Marquee database**. A dialog box pops up. Enter the IP addresses/unit numbers for the slave marquees and create Marquee Groups that would contain multiple units.

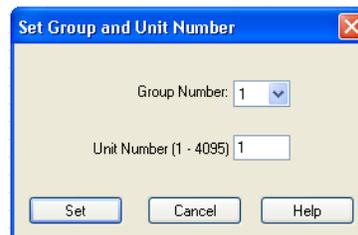


You can also assign a group and unit number to the Marquee connected to the PC.

Click on menu **Marquee ->Set Group and unit number**

Assign an appropriate group and unit number.

This is the address of the marquee being programmed.



3.4 TRANSFERRING PROJECT TO MARQUEE

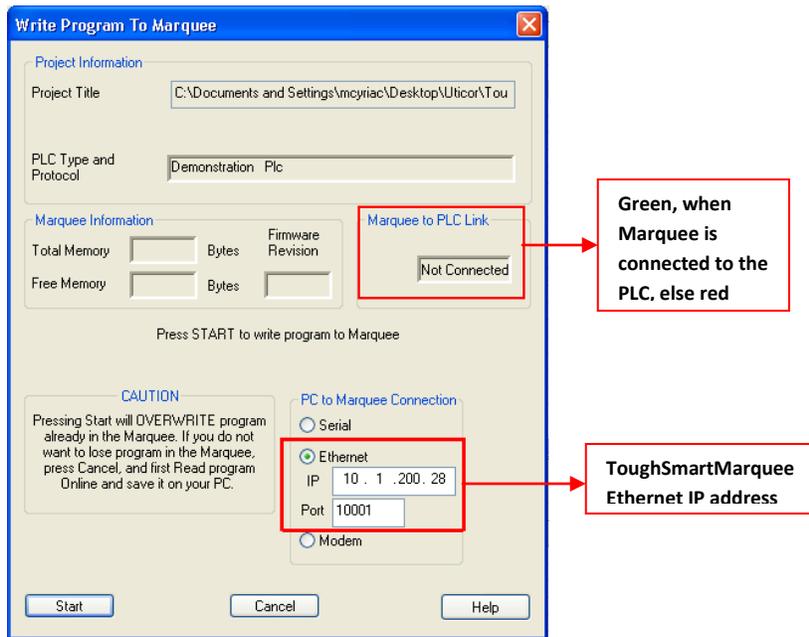


Fig 3.4 Write Program to Marquee

1. In the Main programming window, Click on menu **File ->Transfer to Marquee** to send the Messages to the Marquee.

2. A dialog box appears as shown in Fig 3.4

3. Enter the Marquee’s IP address and press ‘Start’.

Green, when Marquee is connected to the PLC, else red

ToughSmartMarquee Ethernet IP address

4. TECHNICAL SUPPORT

If you are still having difficulty with a particular aspect of installation or messaging, technical support is available at 1-800-TEC-ENGR (832-3647) or FAX us at 1-563-359-9094. You can also contact technical support through our website at www.uticor.net.